CLAIMS

1. A production process of a polymerized toner, comprising Step 1 of forming droplets of a polymerizable monomer composition containing a polymerizable monomer, a colorant and a polymerization initiator in an aqueous dispersion medium containing a dispersion stabilizer to prepare an aqueous liquid dispersion with the droplets dispersed therein, and Step 2 of heating the aqueous liquid dispersion in a polymerization container to polymerize the polymerizable monomer composition, thereby forming colored polymer particles,
wherein in Step 2,

(1) a corrosion-resistant metal container, the surface roughness Ry of an inner wall of which is at most 3 μm, is used as the polymerization container, and

(2) upon the heating of the aqueous liquid dispersion in the polymerization container to conduct polymerization,

i) the temperature of the aqueous liquid dispersion is raised up to a temperature 5°C lower than a target polymerization temperature at a heating rate of 20 to 60°C/hr,

ii) the temperature of the aqueous liquid dispersion is raised up to the target polymerization temperature from the temperature 5°C lower than the target polymerization temperature at a heating rate of 5 to 30°C/hr, and

iii) after the temperature of the aqueous liquid

dispersion reaches the target polymerization temperature, a polymerization reaction is carried out while controlling the temperature of the aqueous liquid dispersion so as to fall within a range of (the target polymerization temperature ± 3°C).

2. The production process according to claim 1, wherein in Step 1, the droplets of the polymerizable monomer composition are formed in a first aqueous dispersion medium (A1) containing the dispersion stabilizer to prepare an aqueous liquid dispersion with the droplets dispersed therein, and in Step 2, a second aqueous dispersion medium (A2) containing 0.1 to 5% by weight of the dispersion stabilizer is poured into the aqueous liquid dispersion thus obtained in a proportion of 10 to 150 parts by weight per 100 parts by weight of the polymerizable monomer prior to initiation of the heating.

3. The production process according to claim 1, wherein in Step 2, water is sprayed during the polymerization to retain an upper inner wall surface of the polymerization container in a wetted state.

4. The production process according to claim 1, wherein the corrosion-resistant metal container is a stainless steel container.

5. The production process according to claim 4, wherein the stainless steel container is an austenitic stainless steel container.

6. The production process according to claim 1, wherein the surface roughness Ry of the inner wall of the polymerization container is at most 1 μm.

7. The production process according to claim 1, wherein the surface roughness Ry of the inner wall of the polymerization container is at most 0.5 μm.

8. The production process according to claim 1, wherein the polymerization container is a corrosion-resistant metal container, the surface roughness Ry of the inner wall of which is controlled to at most 3 μm by buff polishing, electrolytic polishing or a combination thereof.

9. The production process according to claim 1, wherein in Step 1, the temperature of the aqueous liquid dispersion is controlled within a range of 10 to 40°C.

10. The production process according to claim 1, wherein in Step 2, the temperature of the aqueous liquid dispersion is raised up to the temperature 5°C lower than the target polymerization temperature at a heating rate of 25 to 50°C/hr.

11. The production process according to claim 1, wherein in Step 2, the temperature of the aqueous liquid dispersion is raised up to the target polymerization temperature from the temperature 5°C lower than the target polymerization temperature at a heating rate of 10 to 20°C/hr.

12. The production process according to claim 1, wherein in Step 2, the target polymerization temperature is determined to be within the range of ± 2°C from hourly half-life temperature.

13. The production process according to claim 1, wherein the dispersion stabilizer is colloid of a hardly water-soluble metal hydroxide.

14. The production process according to claim 1, wherein in Step 2, the polymerization is conducted until a conversion into a polymer reaches substantially 100%.

15. The production process according to claim 1, wherein in Step 2, the temperature of a jacket arranged at an outer periphery of the polymerization container and the temperature of the aqueous liquid dispersion are measured to make temperature control using a cascade control method.

16. The production process according to claim 1, which comprises a step of adding a polymerizable monomer for shell to the aqueous liquid dispersion containing the colored polymer particles formed after Step 2 to further conduct polymerization, thereby forming a shell polymer on the surfaces of the colored polymer particles to form core·shell type colored polymer particles.

17. The production process according to claim 1, wherein the colored polymer particles are substantially spherical, the volume average particle diameter dv thereof is 3 to 10 μm, and a particle diameter distribution represented by a ratio dv/dp of the volume average particle diameter dv to the number average particle diameter dp is 1 to 1.2.

18. The production process according to claim 16, wherein the core·shell type colored polymer particles are substantially spherical, the volume average particle diameter dv thereof is 3 to 10 μm, and a particle diameter distribution represented by a ratio dv/dp of the volume average particle diameter dv to the number average particle diameter dp is 1 to 1.2.